

## REMARKS

### I. Introduction

The undersigned thanks Examiner Ho for her thorough examination of this application and respectfully requests the Examiner to consider the remarks as set forth below and to reissue the patent with all pending claims.

The Office Action rejects claims 15 – 18, 20, 21, 23, 27, and 29 – 31 under 35 U.S.C. §102(b) as anticipated by A.S.A.M.I. Group (Operative Principles of Ilizarov). It also objects to claims 23 and 31, stating that “is positioned on a patient” should be “is adapted to be positioned on a patient.” Finally, the Office Action objects to Claims 22, 24 – 26, 28 and 32 – 34 as being dependent upon a rejected base claim, but indicates they would be allowable if rewritten in independent form.

Claims 1 – 14 and 36 – 48 are now pending in this application, after claims 15 – 35 are cancelled by this amendment and response. Claims 1 – 14 stand allowed, and claims 36 – 48 are newly added. Support for the newly added claims can be found in at least the locations identified below:

New Claim	Support In The '143 Patent
36 – 39	Figs. 2, 4 and 11. Col. 3, lines 39 – 64.
40	Col. 9, lines 33 – 34.
41	Col. 9, lines 46 – 55; Col. 10, lines 1 – 10.
42	Col. 1, lines 13 – 17.
43	Col. 3, lines 39 – 43.
44	Fig. 4.
45	Figs. 2, 4 and 11. Col. 3,

	lines 39 – 64.
46	Figs. 2 and 4. Col. 3, lines 43 – 46.
47	Col. 1, lines 13 – 17.
48	Fig. 2.

## **II. Comments on Newly Added Claims 36 – 48.**

Newly added claims 36 – 48 all disclose orthopaedic spatial fixation systems within the scope of the '143 Patent that are unlike systems disclosed in the reference applied by the Office Action. Claims 36 – 48 all require a plurality of fixation plates adapted to be connected to each other with a plurality of attachment structures "such that at least one of the attachment structures connecting two of the plates is not substantially parallel to at least one other of the attachment structures connecting the same two plates...."

Previous fixation systems, including the systems disclosed in the A.S.A.M.I. publication, do not teach, suggest or disclose these features. The A.S.A.M.I. publication discloses Ilizarov systems that have rods substantially parallel to one another connecting adjacent rings. The A.S.A.M.I. publication does not disclose systems that have connecting rods not substantially parallel to other connecting rods connecting adjacent rings.

Systems using attachment structures where the attachment structures are not substantially parallel to all the other attachment structures are more difficult to position and adjust than the systems disclosed in the A.S.A.M.I. publication. Adjusting attachment structure length in a non-parallel system does not affect the relative position of the rings in the same manner as adjusting rod length in the systems disclosed in the A.S.A.M.I. publication, which is more easily predicted by the orthopedist or other user. Consequently, the location of the points for the

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attachment structures in a non-parallel system is more critical than the location of points in the systems disclosed in the A.S.A.M.I. system.

Because The A.S.A.M.I. publication does not teach, suggest or disclose fixation plates "adapted to be connected to each other with a plurality of attachment structures such that at least one of the attachment structures connecting two of the plates is not substantially parallel to at least one other of the attachment structures connecting the same two plates....", the A.S.A.M.I. publication does not teach, suggest or disclose each and every limitation of any of claims 36-48.

### III. CONCLUSION

The undersigned respectfully submits that all pending claims are in condition for reissue. No fees are believed to be due at this time, however, if that belief is incorrect, the undersigned authorizes any other fees to be charged to Deposit Account number 11-0855. If there are any matters that can be addressed by telephone, the Examiner is urged to contact the undersigned at 404 815-6291.

Respectfully submitted,



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## CLEAN COPY OF THE CLAIMS

1. An orthopaedic spatial fixation system for holding bone parts comprising a plurality of fixation plates wherein each plate includes a body portion having  $n$  attachment structures positioned therein, whereby said attachment structures are substantially positioned along an arc of  $\alpha^\circ$  of a circle defined by a diameter  $d$ , and the chord length between adjacent attachment structures is substantially equal to  $l$ , and

$$d \sim l \left( \sqrt{\frac{1}{\tan^2\left(\frac{\alpha}{2n}\right)} + 1} \right)$$

and whereby the diameter  $d$  for each plate within the system is unique, and the value for  $n(360/\alpha)$  for each consecutive plate diameter  $d$  in the system is a multiple of 3.

2. The orthopaedic spatial fixation system of claim 1 further comprising bone pins for interfacing the bone parts and plates; and,

a plurality of struts that extend between the plates to hold the plates in a selected position relative to one another and relative to the bone parts;

wherein the struts are attached to the plates at the attachment structures; and,

wherein a plurality of the struts have adjustable length sections for varying the length of the strut to adjust the relative position of the plates.

3. The orthopaedic spatial fixation system of claim 2 wherein the attachment structures on at least one of the plates are one hundred twenty degrees ( $120^\circ$ ) apart.
4. The orthopaedic spatial fixation system of claim 1 wherein rotation of one plate one hundred twenty degrees ( $120^\circ$ ) relative to an adjacent plate results in the same alignment of adjacent attachment structures as before such rotation of the plates.
5. The orthopaedic spatial fixation system of claim 1 wherein the plates are symmetrically configured so that if one plate is placed over an adjacent plate, the attachment structures in each plate can be aligned.
6. The orthopaedic spatial fixation system of claim 5 wherein the plates are symmetrically configured so that one plate can be flipped over without affecting the alignment of adjacent attachment structures.
7. The orthopaedic spatial fixation system of claim 2 wherein there are two plates and each plate includes 3 attachment structures.
8. The orthopaedic spatial fixation system of claim 7 wherein  
  
there are six struts each having a first end and a second end;  
  
the first end of each strut is attached to one of the plates and the second end of each strut is attached to the other plate;

the ends of the struts are attached to the plates at the attachment structures; and, each hole accommodates two strut ends, one from each of two adjacent struts.

9. The orthopaedic spatial fixation system of claim 1, wherein the attachment structures are holes.
10. The orthopaedic spatial fixation system of claim 1, wherein the attachment structures are pegs that are adapted to facilitate attachment of an accessories adapted to receive the pegs.
11. The orthopaedic spatial fixation system of claim 1, wherein the circle comprises a groove and the attachment structures are clamps attached to the groove.
12. The orthopaedic spatial fixation system of claim 1, further comprising markings or etches to designate the attachment structure positions.
13. The orthopaedic spatial fixation system of claim 1, further comprising one or more plates being multiple diameter plates having a second set of attachment structures.
14. The orthopaedic spatial fixation system of claim 13, wherein the second set of attachment structures is not spaced according to the diameter equation and cord length limitations.
36. An orthopaedic spatial fixation system, comprising a plurality of arcuate shaped fixation plates, wherein each plate comprises a plurality of attachment

points, at least some of the attachment points being in sets of three attachment points, the three attachment points in a set being spaced substantially 120 degrees apart from each other along an arc of the fixation plate; wherein the plates are adapted to be connected to each other with a plurality of attachment structures such that at least one of the attachment structures connecting two of the plates is not substantially parallel to at least one other of the attachment structures connecting the same two plates, the number of attachment structures being at least six and a multiple of 3, whereby rotating a first one of the fixation plates substantially 120 degrees from a starting position in a plane substantially parallel to another one of the fixation plates causes the first fixation plate to present the same geometrical arrangement of attachment points to the attachment structures as the geometrical arrangement of attachment points presented to the attachment structures when the first fixation plate was in the starting position.

37. The orthopaedic spatial fixation system of Claim 36, whereby rotating the first fixation plate substantially 60 degrees from the starting position in a plane substantially parallel to another one of the fixation plates presents the same geometrical arrangement of attachment points to the attachment structures as the geometrical arrangement of attachment points presented to the attachment structures when the first fixation plate was in the starting position.

38. The orthopaedic spatial fixation system of Claim 36, wherein the number of attachment points is a multiple of six, providing 2x3 symmetry.

39. The orthopaedic spatial fixation system of Claim 36, wherein at least one of the fixation plates is ring shaped.

40. The orthopaedic spatial fixation system of Claim 36, wherein the plurality of attachment points are positioned such that in use, at least some of the attachment points on one of the plates move into alignment with at least some of the attachment points on another plate as adjustment is effected.

41. The orthopaedic spatial fixation system of Claim 36, wherein the attachment points are positioned along an arc of  $\alpha^\circ$  of a circle defined by a diameter  $d$ , and the chord length between adjacent attachment structures is substantially equal to  $l$ , and the defined relationship comprises

$$d \sim l \left( \sqrt{\frac{1}{\tan^2 \left( \frac{\alpha}{2n} \right)} + 1} \right)$$

42. The orthopaedic spatial fixation system of Claim 36, wherein the orthopaedic spatial fixation system is adapted to be positioned on a patient.

43. The orthopaedic spatial fixation system of Claim 36, wherein the attachment structures comprise six adjustable struts, a first end of each of the struts connected to one of the attachment points on one of the fixation plates and a second end of each of the struts connected to one of the attachment points on another one of the fixation plates, wherein the attachment points connected to struts are each connected to two struts.

44. The orthopaedic spatial fixation system of Claim 36, wherein the attachment structures comprise six adjustable struts, each strut connected at a first end to one of the attachment points of one of the fixation plates and each strut connected at a second end to one of the attachment points of another one of the fixation plates,



wherein each attachment structure that is connected to a strut is only connected to one strut.

45. An orthopaedic spatial fixation system, comprising a plurality of fixation plates wherein each plate comprises a plurality of attachment points, at least some of the attachment points being in sets of three attachment points, the three attachment points in a set being space substantially 120 degrees apart from each other along an arc of the fixation plate; wherein the plates are adapted to be connected to each other with a plurality of attachment structures such that at least one of the attachment structures connecting two of the plates is not substantially parallel to at least one other of the attachment structures connecting the same two plates, the number of attachment structures being at least 6 and a multiple of 3, whereby rotating the first fixation plate substantially 120 degrees from a starting position in a plane substantially parallel to another one of the fixation plates presents the same geometrical arrangement of attachment points as the geometrical arrangement of attachment points presented to the attachment structures when the first fixation plate is in the starting position.

46. The orthopaedic spatial fixation system of Claim 45, further comprising an accessory adapted to be attached to one or more of the fixation plates.

47. The orthopaedic spatial fixation system of Claim 45, wherein the orthopaedic spatial fixation system is adapted to be positioned on a patient.

48. The orthopaedic spatial fixation system of Claim 45, wherein the attachment structures comprise six struts, a first end of each of the struts connected to one of the attachment points on one of the fixation plates and a second end of each of the struts connected to one of the attachment points on another one of the fixation

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plates, wherein the attachment points connected to struts are each connected to two struts.